Abstract

An electrically tunable Fabry-Perot structure using a deformable multi-layer mirror construction wherein $Ga_{1-a}Al_aAs$, where $a < 0.1$, is used as the sacrificial layer which may be selectively removed using a citric acid enchant. The multi-layer mirrors consist of N and M period of quarter wavelength layers where N and M are integers, or integers plus 1/2. Further, the mirrors are made from alternating layers of $Ga_{1-x}Al_xAs$, where $x > 0.96$, and a material selected from the group consisting of either $Ga_{1-z}Al_zAs$, where $0.7 > Z > 0$, or $Ga_{1-y}Al_yAs/Ga_{1-z}Al_zAs/Ga_{1-y}Al_yAs$, where $0.7 > Z > 0$ and $y > 0.5$. The $Ga_{1-x}Al_xAs$ is wet oxidized by exposing its edge to water in a nitrogen or helium atmosphere at a temperature of between about 360°C and 450°C so as to transform it to AlO_x. The resulting AlO_x layers abut the sacrificial layer and act as etch stops during the formation of a cantilever Fabry-Perot structure by etching of the sacrificial layer.